# D. Hussey

## Yarn Winder.

No. 25,266. Patented Aug. 30, 1859.

Fig. 2.

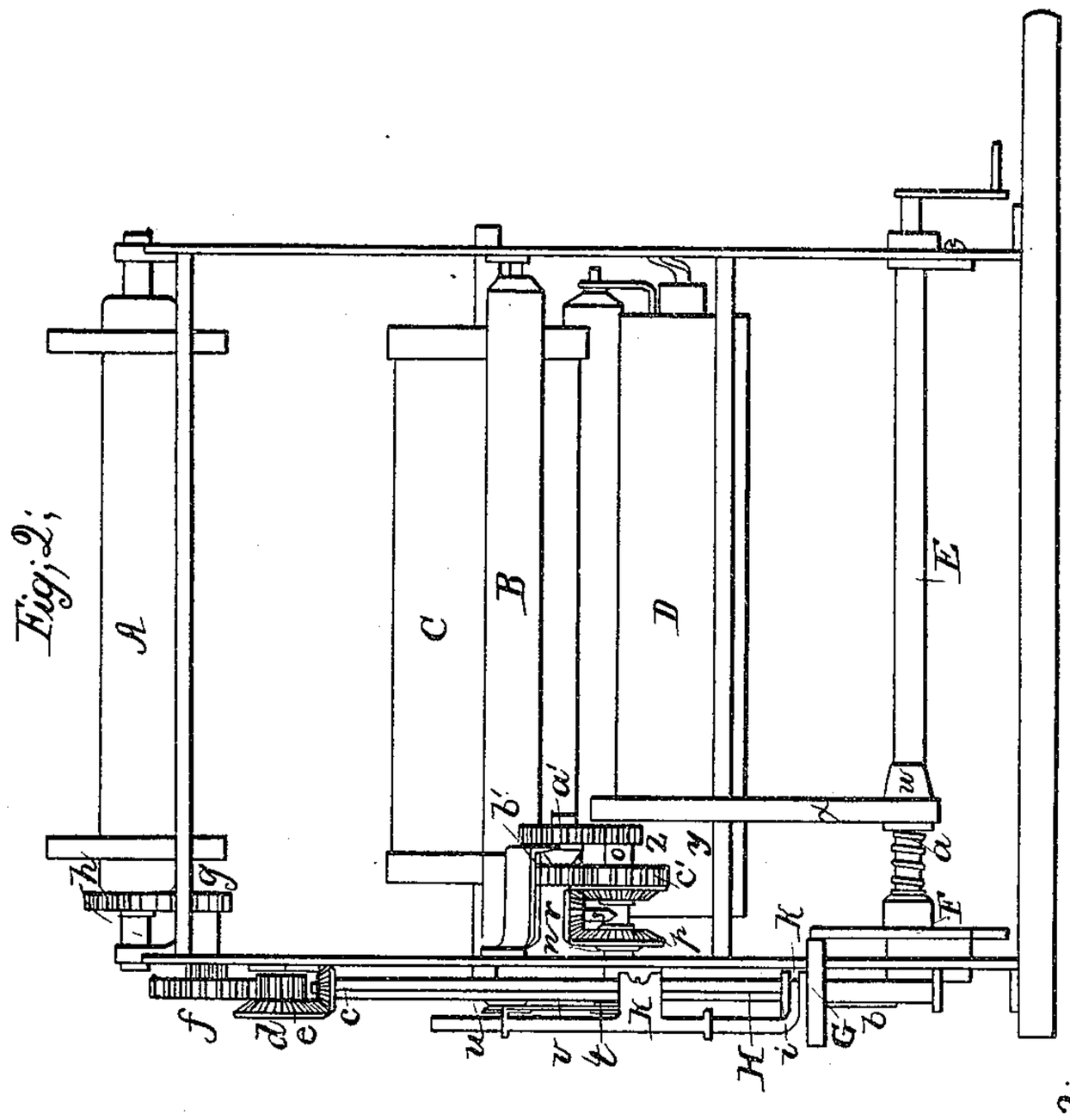



Fig. 1.

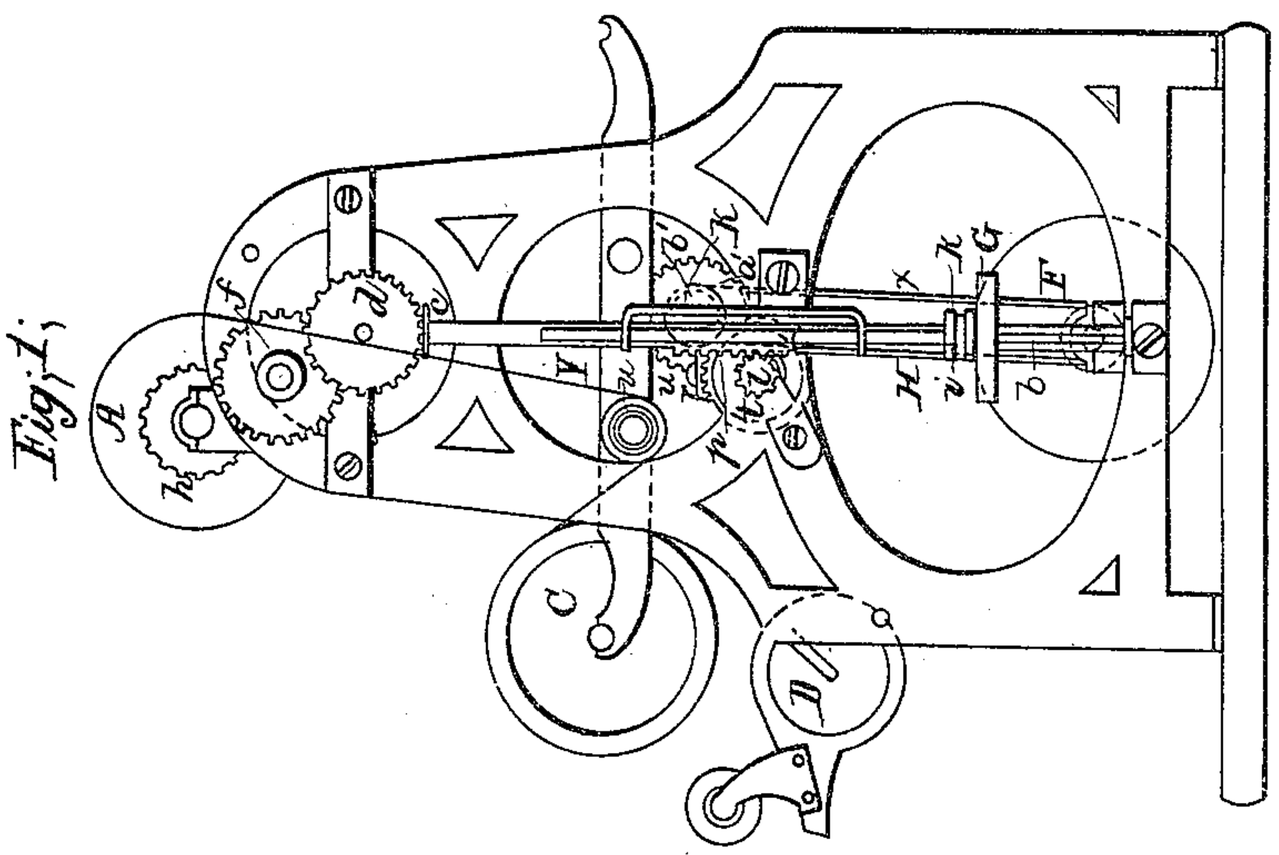
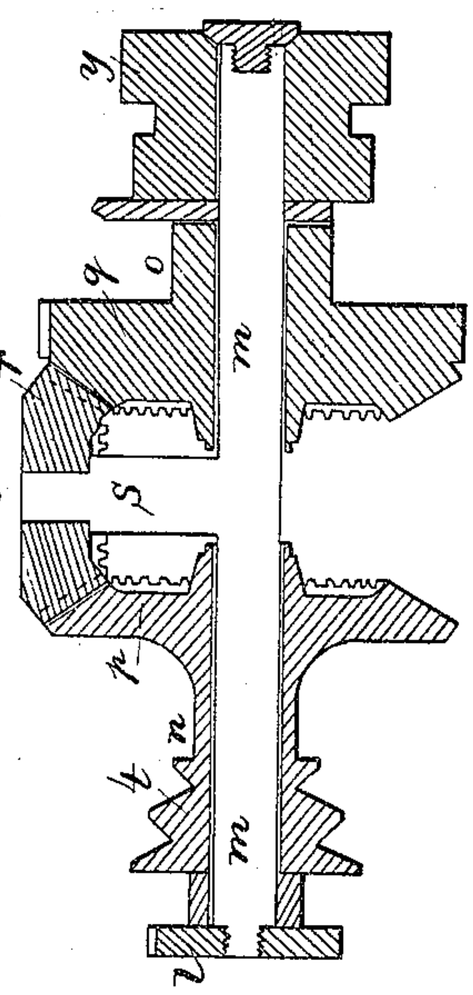



Fig. 3.




Witnesses;
F. K. Hale Jr
Laurence Lyons.

Inventor;
Daniel Hussey

# UNITED STATES PATENT OFFICE.

DANIEL HUSSEY, OF NASHUA, NEW HAMPSHIRE.

## MACHINERY FOR WINDING WARPS UPON THE BEAM.

Specification of Letters Patent No. 25,266, dated August 30, 1859.

*To all whom it may concern:*

Be it known that I, DANIEL HUSSEY, of Nashua, in the county of Hillsboro and State of New Hampshire, have invented a new and useful or Improved Mechanism for Winding Yarn upon a Beam or Roller with a Uniform Velocity; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1, is a side elevation, and Fig. 2, a rear elevation of the same. Fig. 3, is a longitudinal section of the mechanism hereinafter described, and termed the "compound motion."

The nature of the said invention consists in a peculiar combination for maintaining uniformity of wind or surface speed of wind on the yarn beam.

Warp dressers have hitherto been constructed so that the speed of winding the yarn upon the beam, had to be varied by the operator. The beam being driven at a uniform speed, would cause the wind of the yarn or quantity wound thereon to constantly increase in diameter. The accumulation of yarn in like proportion would increase, the length of yarn which would be drawn forward or made to pass a given point in a given time. In ordinary cases, it is desirable to wind up the yarn as fast as it will properly dry. Should it run in a damp state on the beam, the yarn would be liable to injury by mildew or otherwise. In order to guard against this cones or cone pulleys have been constructed and applied so that the operative could change the driving belt of the beam from pulley to pulley and thus alter the speed of the beam. Other similar contrivances have been used such as a friction pulley acting on the periphery of another pulley which could be moved nearer to or farther from the center of the first pulley and thus vary the speed of the beam. But unless the operative gave all or a greater part of his time and attention to the matter and moved the belt or substitute just in proportion to the increasing size of the beam there would be a variation in the speed of the yarn. Generally, he would move the belt or substitute at long intervals and the yarn frequently run on damp and caused more or less damage. My improved dresser machinery is so constructed that notwithstanding the variation in the wind of the yarn, the yarn will be wound up with a uniform velocity. Furthermore, the degree of velocity can be varied at will to suit the variations in the hygrometric or thermometric changes in the atmosphere. Whatever may be the speed adopted for the winding of the yarn it will remain uniform until the machinery may be arranged to produce another rate of speed.

In the drawings, A denotes the yarn beam; B, the rear guide roller; C, the steam heating cylinder, and, D, the fan blower of a common warp dresser, the remainder of which is not exhibited.

The yarn in its passage from the heating cylinder, C, under the guide-roller, B, and to the yarn beam, A, is shown at, Y, in Fig. 1, by a red line.

The driving shaft of the mechanism for operating the yarn beam is exhibited at, E. It carries a vertical disk wheel, F, against whose face or side the periphery of a horizontal friction wheel, G, rests, the wheel, F, being borne against the wheel G by a spring *a*. The wheel G is fixed on a vertical shaft H and so as to be capable of sliding freely and longitudinally thereon and on a spline or feather connection *b*, by which the rotation of the wheel is made to produce that of the shaft. The upper end of the shaft carries a bevel pinion *c*, which drives a train of gears *d*, *e*, *f*, *g*, *h*, the latter of which is fixed on the shaft of the yarn beam A.

From the above, it will be seen that when the shaft E, is put in revolution, it will cause the yarn beam to revolve and wind up the yarn. It will also be seen that the rates of movement of the periphery of the guide roller B, will correspond with or be equal to that of the periphery of the amount or mass of yarn wound on the yarn beam at any time; also, that in proportion as the roll of yarn on the beam may increase in diameter, the draft or velocity of movement of the yarn will be increased. The mechanism to be described overcomes the gradual increase of the draft and renders the draft uniform.

A vertical slide rack, K, (see Figs. 1 and 2) carries a projection or foot *i*, which enters a groove *k*, made in and around the hub of the wheel G. A pinion *l*, on a horizontal shaft *m*, (see Figs. 1 and 3,) engages with the said rack. The shaft *m*, extends through two tubular shafts *n*, *o*, which respectively carry bevel gears *p*, *q*, arranged as shown in the drawing and both made to engage with

a bevel pinion, *r*, carried by an arm, *s*, projecting from the shaft, *m*.

The shaft, *m*, and that of the guide roller B, have cone pulleys, *t*, *u*, applied to them around which a crossed band *v*, extends. Furthermore, the gear, *q*, and its shaft, *o*, are rotated by the driving shaft acting through a pulley *w*, an endless band *x*, a pulley, *y*, and a train of gears, *z*, *a'*, *b'*, *c'*, the latter of which is fixed to the side of the bevel gear *q*. The said gears, *p*, *q*, together with the pinion *r*, the arm, *s*, and shaft, *m*, with their accessories are what is usually termed or may be called a "compound motion." So long as the two gears *p*, *q*, revolve at the same speed, the pinion will revolve, and the arm, *s*, will be stationary, but in case, the outermost gear, *p*, is moved at a faster speed than the other its action on the pinion will be such as to move its supporting arm so as to turn the shaft, *m*, in a manner to cause its pinion, *l*, to depress the rack K, and thereby force the wheel G, downward nearer to the center of the wheel F, whereby the degree of rotary motion of the gear G, will be lessened the same serving to diminish the rate of rotary movement of the yarn beam. Now, as the wind of yarn on the yarn beam may increase the diameter of the roll of yarn will increase, the same creating an increased draft or rate of speed of the yarn against the guide roller B. This, as a matter of course would increase the degree of rotary motion of the periphery or surface of the said roller and as any increase thereof will be attended by a depression of the wheel, G, toward the center of the wheel F, the speed of the yarn beam will be checked so as to render the rate of surface movement of the roll of yarn thereon correspondent with that of the periphery of the guide roller, B. By means of the set of cone pulleys, the rate of movement of the guide roller may be varied for to accomplish such, we have only to change the belt of the pulley into such grooves of them as may be desirable to effect the proper rate of speed for the wind of the yarn on the beam.

Having thus described my invention what I claim is as follows:

I claim the peculiar combination for maintaining uniformity of wind or surface speed of wind on the yarn beam; the same consisting of the friction wheels, G, F, the lifter rack, K, the pinion, *l*, and the compound motion mechanism or their mechanical equivalents; the whole being applied to the yarn guide roller and the mechanism for adjusting the yarn beam, substantially in manner and so as to operate as specified.

In testimony whereof I have hereunto set my signature.

DANIEL HUSSEY.

Witnesses:
R. H. EDDY,
LAURENCE LYONS.